TO: Director, National Institute for Occupational Safety and Health

FROM: California Fatality Assessment and Control Evaluation (FACE) Program

SUBJECT: Electrician dies when crushed between the rails of a workbasket mounted on a hydraulic crane and the face of a billboard sign.

SUMMARY
California FACE Report #00CA007

A 32 year-old male electrician died when crushed between the guardrails of a workbasket and the face of a billboard sign. The decedent was changing the fluorescent light bulbs in the sign. To gain access to the sign, the decedent used a truck-mounted hydro/electric crane workbasket with joystick type controls mounted on the yoke of the basket (see exhibit #4). After the decedent positioned the workbasket at the base of the sign, he swung the sign face up from the bottom over his head. As the decedent pushed the sign face upward over his head trying to gain enough clearance to place the PVC pipe in place, he inadvertently forced the panel against the workbasket controls, activating them, forcing the workbasket into the sign. As the workbasket came forward into the sign, it jammed the sign face into the controls, preventing the controls from returning to a neutral position. The decedent's co-worker, working on the opposite side of the sign, tried to rescue the decedent by lifting the panel, activating the main controls, and cutting away the sign face, but was unsuccessful.
The CA/FACE investigator determined that, in order to prevent future occurrences, employers, as part of their Injury and Illness Prevention Program (IIPP) should:

- Prepare a written job hazard analysis (JHA) to determine the safest procedures to follow.
- Protect workbasket controls against unexpected activation.
- Develop rescue procedures that show how to override the auxiliary controls when someone is in the workbasket.

INTRODUCTION

On July 12, 2000, at approximately 8:40 a.m., a 32-year-old male electrician died from injuries received when crushed between the guardrail of a workbasket and the face of a billboard sign. The CA/FACE investigator learned of this incident on July 13, 2000, through an article in the local newspaper. On July 19, 2000, the CA/FACE investigator traveled to the decedent's place of employment and interviewed employees of the company. The CA/FACE investigator also traveled to the Department of Industrial Relations, Division of Occupational Safety and

Health (Cal/OSHA) district office that responded to the incident site and discussed the incident with the investigating engineer.

The employer of the decedent was an electrical contractor specializing in exterior and interior industrial lighting and neon-fluorescent sign repair. They had been in business for 38 years. The employer had on average 26 employees, with the decedent working for them for the past 12 years. The decedent and a co-worker were at the job site the day of the incident.
The employer had a written IIPP with all the required elements and an on-site safety manager. Training and safety classes were held every two weeks and these were documented. Training was accomplished through training films in a classroom setting and on-the-job-training (OJT). The vehicle maintenance and safety checks were also documented and kept on file.

INVESTIGATION

The site of the incident was a large billboard sign located off a major freeway (exhibit #1). The base of the sign was approximately 12 feet from the ground. Access to the sign was by a private gravel road that was level and well maintained. The truck involved in this incident was equipped with four rectangular outriggers and a hydro/electric crane mounted on an 18-foot bed. The crane's retractable boom measured 72 feet when fully extended and was capable of rotating 360 degrees continuously in any direction. The booms elevation was capable of reaching 85 degrees above the horizontal position. The main electrical controls were mounted on the left side of the base of the crane and were equipped with a master cut off switch. The control panel for the workbasket contained joystick type controls-and was mounted on the yoke of the workbasket (exhibit #4). The workbasket, mounted on the end of the boom, was self-leveling and measured 24 x 21 x 44 inches.

On the day of the incident, the decedent and his co-worker, working as single man crews, arrived at the site and set up their trucks on each side of the sign. Their job was to replace the defective fluorescent bulbs in the sign. The decedent was on the east side of the sign, the co-worker on the west side. The decedent set the truck outriggers, then climbed into the workbasket and maneuvered it to the base of the billboard sign. Once in position, the decedent swung the bottom of the sign face up over his head. This particular sign did not have a safety latch to hold the sign face in the open position, so the decedent intended to use a piece of PVC pipe as a wedge to hold the sign face open. As the decedent swung the face of the sign over his head and attempted to place the piece of PVC pipe in place, the sign face made contact with the workbasket controls mounted on the workbasket yoke, activating the controls. This action caused the boom to go forward into the sign, pinning the decedent between the frame of the sign and the workbasket. As the workbasket came forward into the sign, it jammed the sign face into the controls, preventing the controls from returning to a neutral position.

According to the decedent's co-worker, as he was removing the fluorescent bulbs from his side of the sign, he heard a crash and the decedent yell. The co-worker immediately lowered his workbasket to see what was wrong and noticed the decedent wedged in between the frame of the sign and the workbasket. Seeing that the decedent was not moving, the co-worker immediately radioed for help then got a ladder from his truck and climbed up to the decedent to try and lift the sign face, but it wouldn't budge. He then went to the main electric control panel to try to relieve the pressure on the decedent, but was unsuccessful because of the pressure on the controls in the bucket. The co-worker didn't turn off the master cut off switch located directly below the below the main control panel (exhibits # 6 & 7). The co-worker then got an electric saw and cut the sign face on each side of the decedent to try and relieve the pressure. At this point, the Fire

Department arrived and took over the rescue. The paramedics checked for and found no pulse or spontaneous respirations and pronounced death at 8:59am.

CAUSE OF DEATH

The cause of death, according to the death certificate, was asphyxiation due to external compression of the chest with right rib fractures.

RECOMMENDATIONS / DISCUSSION

Recommendation #1 : Prepare a written job hazard analysis (JHA) to determine the safest procedures to follow.

Discussion: After 12 years on the job, no one questioned the method used to accomplish the task the decedent was performing, especially when past practices never indicated any problems using that method. The possibility that an injury or death might occur when propping open a sign face was never considered. Written in the company's safety program were instructions for completing a job hazard analysis (JHA). It stated that a JHA is an important accident prevention tool because it helps to identify hazards and eliminates or minimizes them before they cause accidents. The company's safety program also detailed how to determine what jobs need to have a JHA performed. This particular job function was never mentioned as a hazard. Had a JHA been written for this job function, this incident might have been prevented.

Recommendation #2: Protect workbasket controls against unexpected activation.

Discussion: Having a protective cover over or a safety guard around the workbasket controls would help prevent any unwanted activation of the controls. The joystick type controls are subjected to unexpected activation whenever the working environment involves excessive movement from tools, materials or arms. These types of controls also pose a risk of jamming if something gets lodged against them, preventing their return to a neutral position. Replacing joystick type switches with buttons that have protective collars would also be a way of preventing unexpected activation.

Recommendation #3: Develop rescue procedures that show how to override the auxiliary controls when someone is in the workbasket.

Discussion: Rescue procedures that have been developed and practiced are usually effective when actually used. If not practiced on a regular basis, then some of the finer details most likely will be forgotten. Most bucket trucks with dual controls have a way of activating the controls from the ground when the basket person becomes disabled. The master control switch for the truck involved in this incident was located below the main switch panel. If used, it would have shut down the system, relieving the pressure on the workbasket, possibly lessening the extent of the injuries sustained by the decedent. Safe practices can only be assured through programs of training and scheduled retraining, rewards, and progressive disciplinary measures.

References:

California Code of Regulations, Vol. 9, Title 8, Sections
Garland Cranes SPECIFICATIONS, 1983

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December 14, 2000

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FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Health Services, in cooperation with the California Public Health Institute, and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations on work-related fatalities. The goal of this program, known as the California Fatality Assessment and Control Evaluation (CA/FACE), is to prevent fatal work injuries in the future. CA/FACE aims to achieve this goal by studying the work environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact.

NIOSH funded state-based FACE programs include: Alaska, California, Iowa, Kentucky, Maryland, Massachusetts, Maryland, Minnesota, Missouri, Nebraska, New Jersey, Ohio, Oklahoma, Texas, Washington, West Virginia, and Wisconsin.

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Additional information regarding the CA/FACE program is available from:

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